

MEMORY BOARDS



8K STATIC RAM

Utilizing fully static RAM memories (2102) for optimum performance and unrestricted DMA operation, Vector Graphic's 8K Static RAM Memory Board comes fully assembled and tested, and is burned in for 72 hours at 120° C. The board uses four conservatively-rated voltage regulators and is available in 450 nanosecond and 250 nanosecond access time versions. Addressing is in 8K blocks on 8K boundaries, switch selectable. Hardware write protect is also switch selectable.

For added convenience, a dip switch is located at the top of the board to permit memory address relocation without removing the board. The 8K Static RAM Board is fully S-100 bus compatible and incorporates a phantom bootstrap output disable for use with reset and go mainframes. It features solder mask on both sides of the board and gold-plated contact pins for reliable connection.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
CAPACITY	8K bytes
SPEED	250 nS or 450 nS
MEMORY TYPE	2102 Static RAM
POWER REQUIRED	(250nS) +8 Vdc @ 1.6 A (Typ) (450nS) +8 Vdc @ 1.3 A (Typ)
ADDRESSING	Switch selectable by 8K blocks
MEMORY PROTECT	Hardware in 8K blocks, switch selectable
BURN IN	72 Hours @ 120° C
DMA OPERATION	Unrestricted

16K STATIC RAM

The Vector Graphic 16K Static RAM Memory Board provides high quality, S-100 bus compatible memory utilizing state-of-the-art high speed static RAM. It allows unrestricted DMA operation without worrying about refresh cycles as required by dynamic RAM. The 300 nS access static RAM also allows operation with Z-80 based CPU's at full 4 MHz clock speed with no wait states. All signal lines are fully buffered and, in addition, the address lines use Schmitt trigger buffers for extra immunity from bus noise and transients. Use of 4 conservatively rated voltage regulators assures reliable operation in the harshest environments. Addressing is in 8K blocks on 8K boundaries, switch selectable. Hardware write protect is also switch selectable. Each 16K memory board can be assigned to 1 or more of 8 memory banks thus permitting up to 512K bytes of memory in a single chassis. Convenience features include card extractors, switches located at top of board for reconfiguration without removal, plated through holes, solder mask on both sides of the board and gold-over-nickel edge contacts.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
CAPACITY	16K bytes
SPEED	300 nS
MEMORY TYPE	2114 Static RAM
POWER REQUIRED	+8 Vdc @ 1.8 A (Typ)
ADDRESSING	Switch selectable by 8K blocks
MEMORY PROTECT	Hardware in 8K blocks, switch selectable
MEMORY BANKS	8, switch selectable
BURN IN	72 Hours at 125° C
DMA OPERATION	Unrestricted

48K DYNAMIC RAM

The Vector Graphic 48K Dynamic RAM Memory Board provides 49,152 8-bit bytes of random access memory, using 24-16K dynamic memory chips. It can be used in any S-100 bus computer using a Z-80 CPU board (minor modifications may be necessary) and occupies the lower 48K of memory, beginning at 0000H.

Representing a breakthrough in cost effectiveness, the board combines compact inexpensive dynamic memory chips with the refresh provisions of the Z-80 CPU.

The Vector Graphic 48K Dynamic Memory Board has proven to be exceptionally reliable. It features a gridded ground plane and Schmitt trigger input buffers to reduce noise. Accepted design practice was observed in structuring grounds, power supply and bypass.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
CAPACITY	49,152 8-bit bytes
BUFFERING	Buffered address lines; Data input and output
ACCESS TIME	Compatible with Z-80 at 4MHz without wait states
POWER CONSUMPTION	+8 V @ .25A +16 V @ .20A (Typ)
PHANTOM	Output Buffer Disable compatible with Vector Graphic PROM/RAM (Reset and Go) Board
DMA	Must not interrupt the CPU for longer than 2 mS without generating the necessary refresh signals

PROM/RAM

The Vector Graphic PROM/RAM Board combines fully static random access memory with ultra violet light-erasable programmable read-only memory to provide a versatile addition to any system. Using Vector Graphic's PROM monitor, any system can "Reset and Go", eliminating tedious switch toggling of bootstrap routines. The PROM/RAM Board has a capacity of up to 2K bytes of 1702A type PROM and includes 1K of 2102 static RAM. On-board generation of MWRITE allows operation in machines without front panel consoles. The PROM/RAM Board occupies a 4K block of memory and is jumper addressable on 4K boundaries. Jumper selectable wait states allow operation with any 4MHz CPU. As with all Vector Graphic boards, both sides are solder masked and feature gold-over-nickel edge contacts and plated through holes. Available factory assembled and tested.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
CAPACITY	2K bytes PROM (not included); 1K bytes Static RAM
MEMORY TYPE	PROM — 1702A RAM — 2102 Static RAM
ADDRESSING	Jumper selectable by 4K blocks
POWER REQUIREMENTS	+8 Vdc @ 450 mA (Typ) +16 Vdc @ (Depends on quantity of PROM) -16 Vdc (Depends on quantity of PROM)

12K PROM/RAM w/PROM PROGRAMMER

The Vector Graphic 12K PROM/RAM Board is designed to accommodate up to 12K bytes of 2708-type programmable read-only memory and includes 1K of static RAM. The board is functionally divided into two 8K blocks: block A, up to 8K of PROM and block B, up to 4K of PROM and the 1K of RAM. Blocks A and B are independently addressable on 8K boundaries; in block B, the 1K RAM is addressable on 1K boundaries. The 12K PROM/RAM Board is S-100 bus compatible and has the necessary circuitry to perform the reset-and-go function as well as generate MWRITE (jumper selectable). The latest revision of the board includes a PROM programming capability. The necessary software to program one PROM anywhere as necessary is also offered and a switching regulator provides the necessary 26 volt programming voltage.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
CAPACITY	12K bytes PROM/EPROM (not included) 1K bytes Static RAM
SPEED	Static RAM — 450 nS PROM (user selected) — 450 nS (Typ)
MEMORY TYPE	PROM — 2704 or 2708 RAM: 2102 Static RAM
ADDRESSING	Jumper selectable by 8K blocks on 8K boundaries
POWER REQUIRED	+8 Vdc @ 450 mA (Typ) +16 Vdc @ (depends on quantity of PROM) -16 Vdc @ (depends on quantity of PROM)
PROGRAMMING	1 PROM at a time; cycle requires approximately 2 minutes

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CONTROLLER BOARDS

Z-80 CPU

Based on the Z-80 microprocessor, the Vector Graphic Z-80 CPU Board is a fully S-100 bus compatible product designed to provide exceptional performance at the lowest possible cost. It features a jumper selectable automatic wait state which allows 4 MHz operation with slower memory boards while actually maintaining 80% or better throughput speed. All interface signals are fully buffered; the carefully engineered board layout assures reliable operation at 4 MHz. Another special feature of the Z-80 CPU is jumper selectable MWRITE generation for use in systems without a front panel switch console or other source of MWRITE. Quality features include solder mask on both sides of the board, plated through holes, gold-plated edge contacts, socketed IC's from reputable manufacturers and card extractors for easy installation and removal. Available factory assembled and tested.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
PROCESSOR	Mostek Z-80A (MK-3880N) or Zilog Z-80A
NUMBER OF DATA BITS	8
MINIMUM INSTRUCTION CYCLE TIME	1 μ S
INSTRUCTIONS	158 (including all 78 8080A instructions)
CLOCK	2 or 4 MHz (jumper selectable)
POWER REQUIREMENTS	+8 Vdc @ 750 mA (Typ)
INTERRUPTS	All three Z-80 modes
I/O DEVICES	256 input/output addresses

8080 CPU

The Vector Graphic CPU Board utilizes the popular 8080A microprocessor with a powerful 78 instruction set. Included on the board is a real-time clock generator and eight level priority interrupts. Offering a 2 μ S minimum instruction cycle time, the CPU Board can address up to 256 separate input and output devices. The CPU Board is available factory assembled and tested and features solder mask on both sides, plated through holes and card extractors. All IC's are socketed for ease of maintenance.

SPECIFICATIONS

INTERFACE	S-100 bus compatible
PROCESSOR	Intel 8080A
NUMBER OF DATA BITS	8
NUMBER OF ADDRESS BITS	16
INSTRUCTIONS	78
INSTRUCTION CYCLE TIME	2 μ S (Min)
POWER REQUIREMENTS	+8 Vdc @ 900 mA +16 Vdc @ 40 mA (Typ) -16 Vdc @ 10 mA (Typ)
INTERRUPTS	8 level (Prioritized)
I/O DEVICES	256 input/output addresses

BIT STREAMER

The Vector Graphic Bit Streamer I/O Board provides two 8-bit parallel ports (2 input/2 output) and one serial port. Fully S-100 bus compatible, it allows interfacing to most peripherals including terminals, printers, readers and punches. The serial port operates at 27.5 to 38,400 baud (switch selectable) asynchronous data and DC to 38,400 baud synchronous data. Using an 8251 programmable USART, the Bit Streamer I may be software-configured for 5-8 data bits and 1, 1½ or 2 stop bits.

The parallel interface provides two full 8-bit ports with latched strobe inputs for easy connection to keyboards. Data transmission rates greater than 100K bytes/second are possible depending on software.

Available factory assembled and tested, the Bit Streamer I includes solder mask on both sides of the board, operation at 4 MHz CPU clock rates and gold-plated edge connectors.

SPECIFICATIONS

PORTS	1 Serial, 2 Parallel
Serial Port	
SIGNAL LEVELS	EIA RS-232, 20 mA current loop, TTL
DATA RATE	Asynchronous 110-9600 BPS (switch selectable) Synchronous DC-56K BPS
CONTROLLER	8251 Programmable USART
DATA BITS	5-8 Programmable
STOP BITS	1, 1½, 2 Programmable
Parallel Port	
SIGNAL LEVEL	TTL (Input — 1 TTL load) (Output — Drive 5 STD TTL Loads)
NO. OF LINES	16 Output 16 Input 2 Control
DATA TRANSFER RATE	100K bytes/second

BIT STREAMER II

The Vector Graphic Bit Streamer II I/O Board provides three serial input/output ports interfaced at RS-232 levels and 20 mA current loop (one port); two parallel input/output ports; real time clock; maskable interrupt status; and switch selectable baud rates.

Fully S-100 bus compatible, the Bit Streamer II allows interfacing to most peripherals including terminals, printers, readers and punches. Using 8251A programmable USARTS, the board may be software-configured for 5 to 8 data bits and 1, 1½ or 2 stop bits. In addition, by jumper option it can generate interrupt requests.

The board can be operated as an RS-232 port using the initialization and I/O software on the Vector Graphic option C Extended System Monitor PROM. Additional software can then make concurrent use of the other serial and parallel ports.

Available factory assembled and tested the Bit Streamer II includes solder mask on both sides of the board, operation at 4 MHz CPU clock rates and gold plated edge connectors.

SPECIFICATIONS

Serial I/O Ports:

NUMBER OF PORTS	3 Input, 3 Output
I/O LEVELS	RS-232 and 20mA Current Loop (one port)
BAUD RANGE	27.5 — 38,400 (switch selectable)

Parallel I/O Ports

NUMBER OF PORTS	2 Input, 2 Output
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Real Time Clock

FREQUENCY	55 Hz
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Interrupts

MASKABLE USART STATUS	6
REAL TIME CLOCK	1
SPARE	1

General Information

USART TYPE	8251A
BUS	S-100
POWER	+8 V @ 500 mA +16 V @ 25 mA -16 V @ 25 mA

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